**SOIL SCOUT**

SOIL SCOUT MONITORING SERVICE GUIDE

WELCOME PAGE (SITE SELECTION)

The Welcome or home screen shows a list of all Sites that you have permission to view or edit, each represented as a tile. This top-level view provides a summary of devices on the Site, as well as whether there are any Alerts requiring attention. The number of triggered Alerts are presented in red.

Click on the Site that you wish to access.

Access your personal settings and more

Back to this page

Filter Sites

Site tiles or list
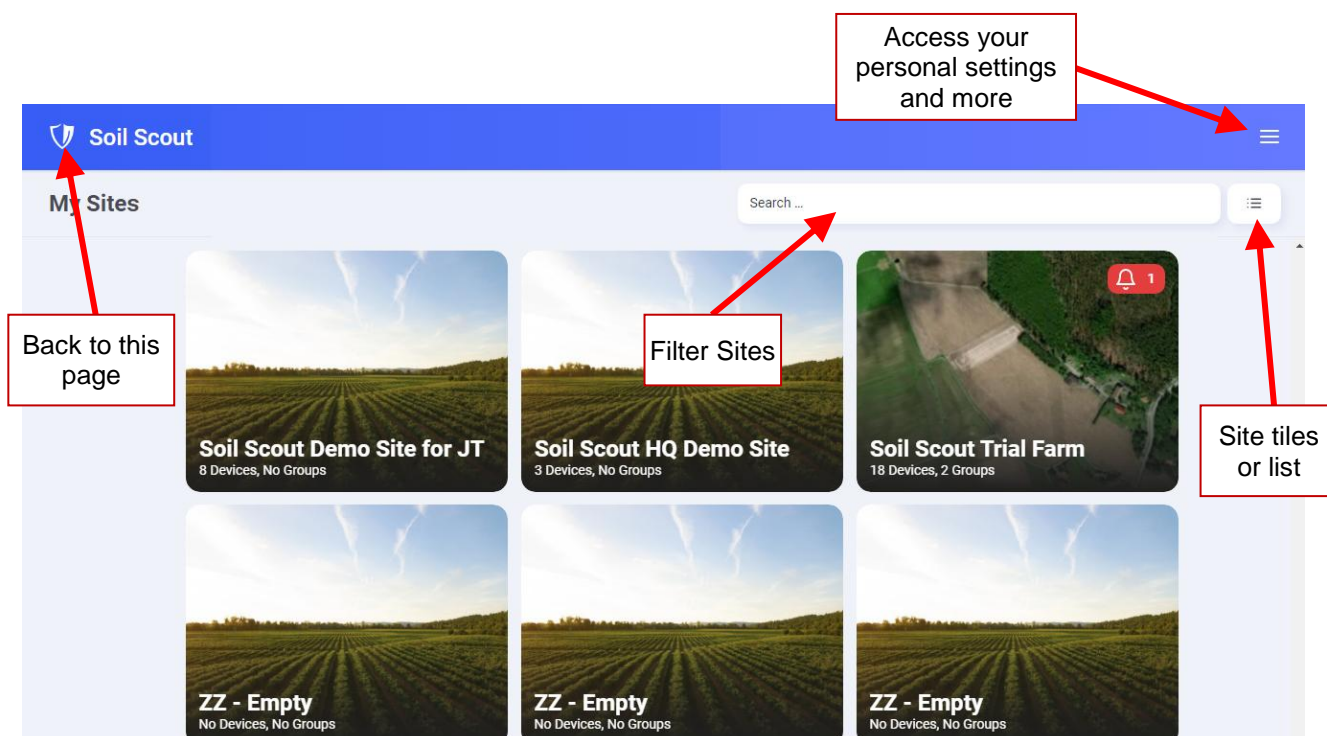
SITE VIEW (MAIN PAGE)

This page presents all the main information regarding your soil measurements. The top bar contains quick access to all core functionalities.

The Device List on the left presents both sensor groups 🏷️ and individual sensors 🔍 with general information.

The sensor list can be 🔽 filtered and sorted ↓🔤 by name or measurement values. The measurement bars can be configured to show moisture, temperature or salinity.

A red bell 🔔 stands for ongoing Alerts. The sensor has reached a thresholds that you have defined for a Scout Group. The bell is a link to the according Alert rule page.
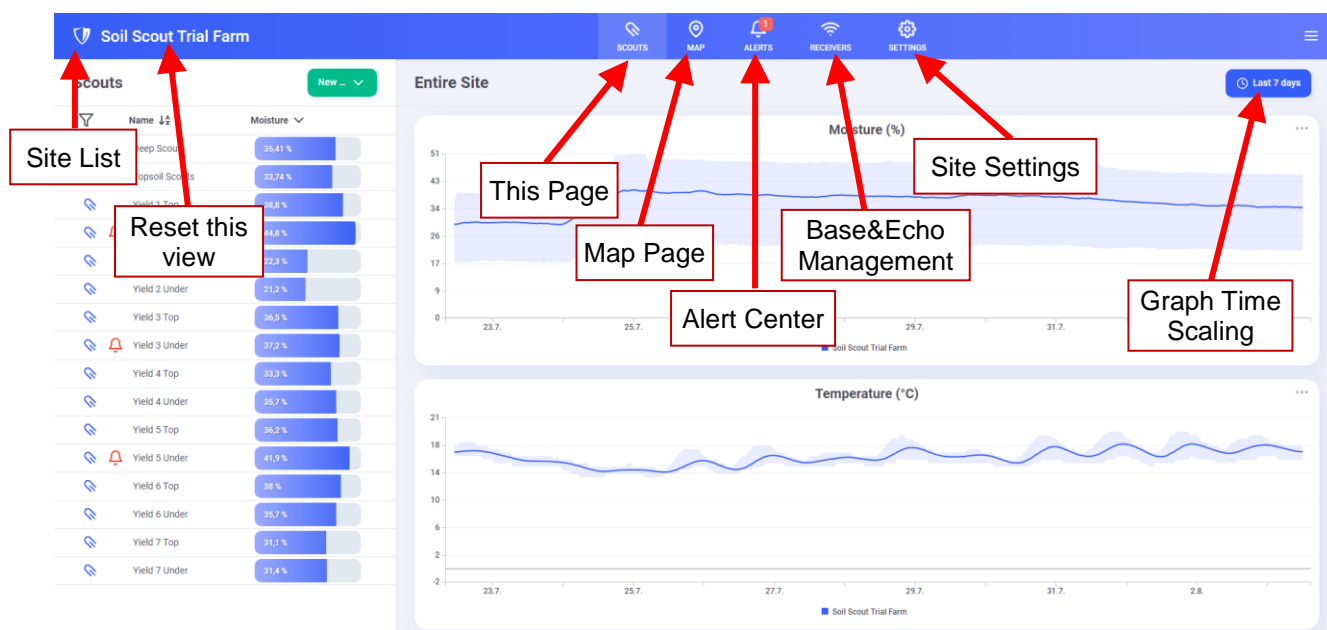
When hovering the mouse hand cursor on a list item, the pen book 📝 symbol will appear to the right. The pen book button will take you to the **Properties** of this Scout / Group / Device.

The **New** button is for adding new **Devices** to your site or creating new **Groups**, which are the basis for comparing different areas, depths, etc. as well as for creating automated Alerts.
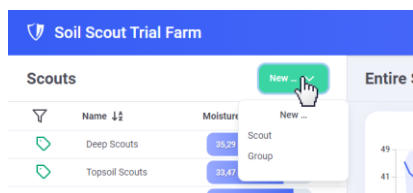
VIEWING GRAPHS

The **Entire Site** graph is a plot of *all devices* on the device list. The solid line is the moving average, while the shaded tube represents the min and max values.

More importantly, when you select one or more **Groups** for comparison by clicking their select boxes ☑ on the left, you will see a similar compilation of tubes, which enables a convenient method to compare selected areas or depths with each other.

The three dots ⋯ in the upper right hand corner contains graph specific options, such as reveling Alert rule lines, exporting data and more. Alert rules will appear as dashed lines. Downloading the *Comma Separated Values* (csv file) will export all visible data (without down filtering) to your preferred spread sheet software. The firts line contains information on the contents of each culomn.
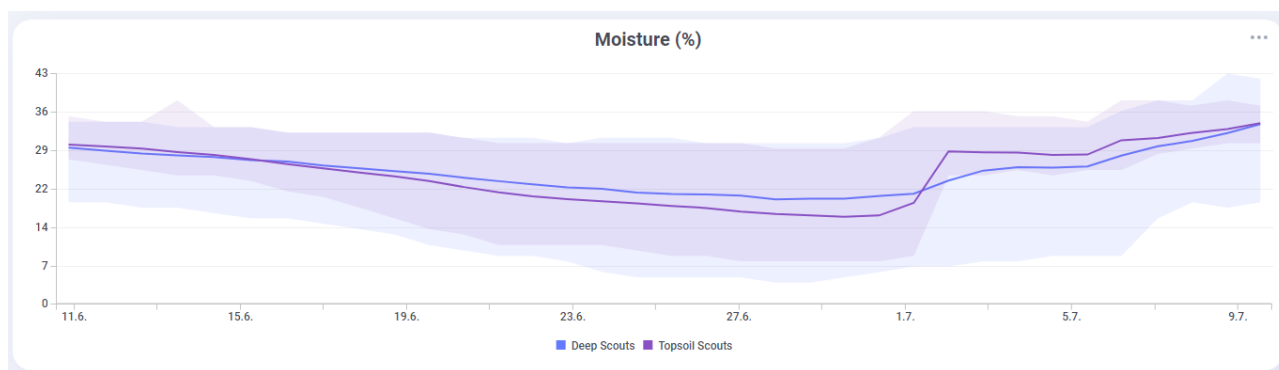
This example comparing two Scout Groups (Deep Scouts & Topsoil Scouts) shows that 1.7. rain has quickly wetted the topsoil and diminished variability, while deep soil reacted several days later and less dramatically.

Selecting different time spans from the time scale menu 🕐 will bring up different data sets. Dragging on the graph will allow for zooming in, while clicking on *Reset zoom* will bring you back out.

ⓘ *The database contains a large amount of data, but to give you a smooth browsing experience, only a filtered set of data is being downloaded depending on the time span and zoom level.*

Howering the mouse hand tool on the graph line legend will enable to highlight individual lines in the graph, clicking on them will toggle them on and off.

All formatting, such as the tool tip date and time units, automatically uses regional settings of your browser.

The Salinity graph extrapolates *what the Electrical Conductivity (EC) **would be** if the soil was saturated wet*. Would you rather see the momentary raw EC without extrapolation, you can choose "*Bulk conductivity*" in the Salinty graph options ⋯ menu.

More detailed information on the Salinity and EC with interpretation guidelines can be acquired from Soil Scout.

MAP PAGE

The Map interface is built on the [ArcGIS API for JavaScript](#) library. The symbols for Scout ✎, Base 🗗 and Echo Repeater 📶 are similar to their corresponding symbols in the Device List.

If a device has not connected for 2 hours, the symbol becomes yellow (Waiting).

When a device has not connected for 12 hours, the symbol becomes red (Not connected).

The Map Widgets menu 📚 will allow you to enable Find and Measurement tools, as well as customize the map imagery.
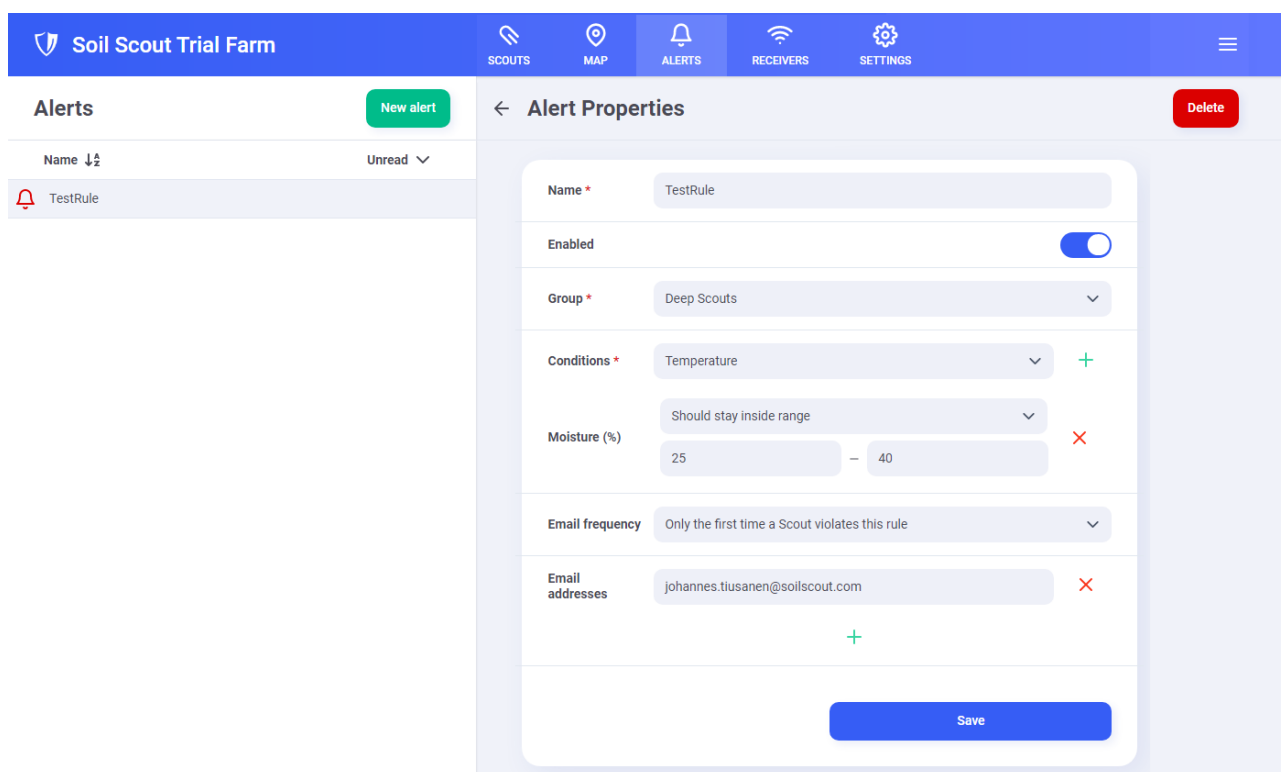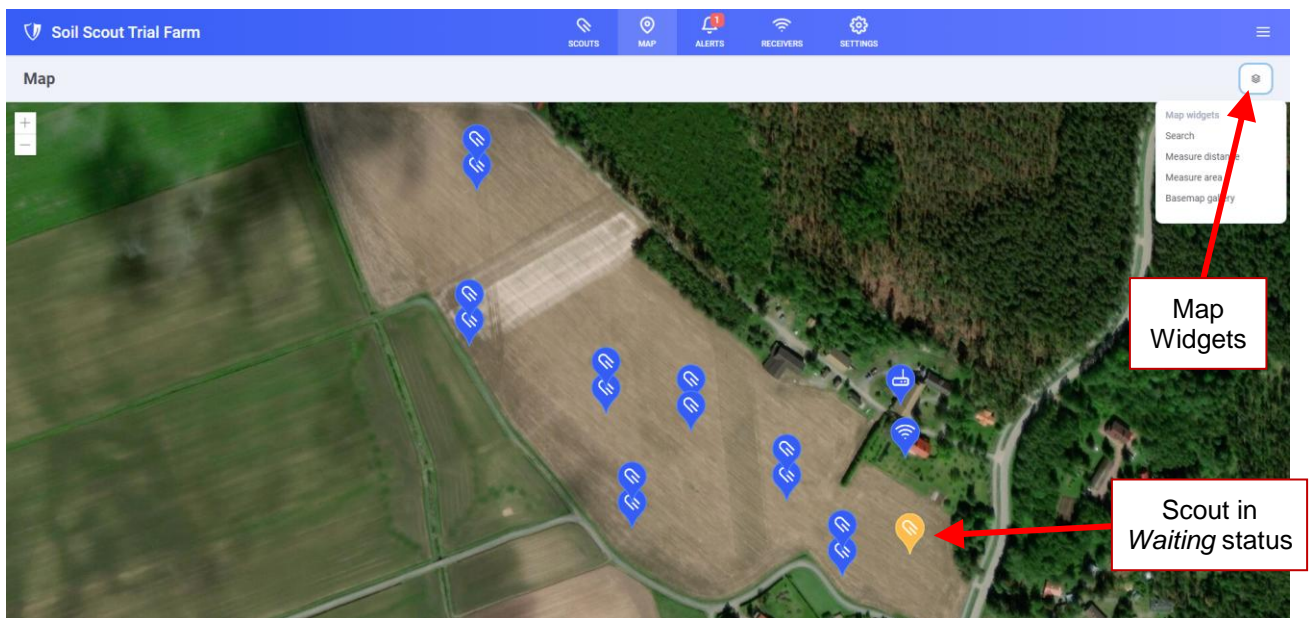

Clicking on the symbols will pop up an measurement information text box.

ALERTS

The automatic Alert system enables you to set predefined measurement value conditions, which will trigger

the Alert and send an according notification email, if desired. The Alert can only target a Group, but you can create a group of one Scout.

Once configured and saved, the Alert will start monitoring for measurements that will trigger the Alarm. When the defined Alarm is no longer relevant for you, you can turn the *Enabled* switch off for later use.

When an Alert has triggered, it will keep the red bell on the Tool Bar until it has been acknowledged by a user. The red bell remains on the Device List as long as the triggering condition remains true. All triggering events are logged into the *Notification History*.
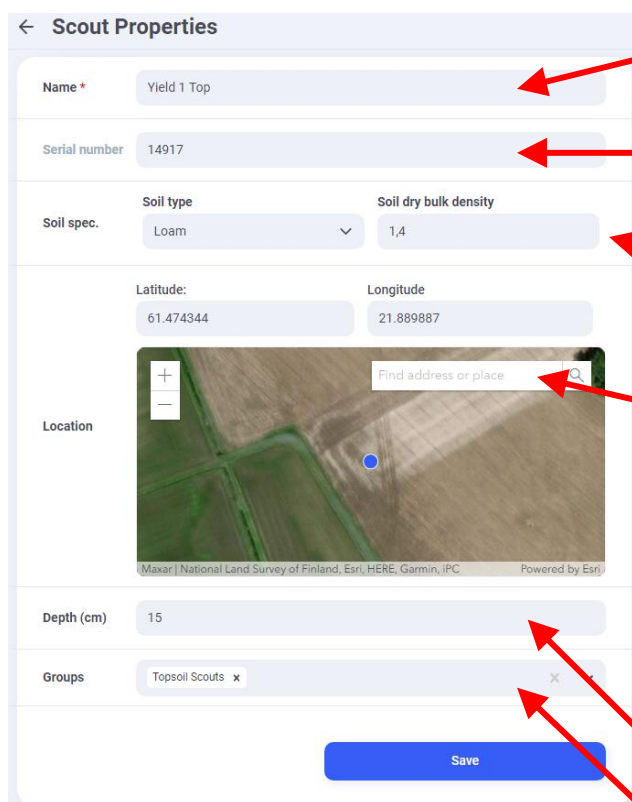

In this example the rule "TestRule" will start monitoring that Scouts in the "Deep Scouts" group stay inside the desired moisture range 25-40 %. If a measurement value outside the range is received, the email recipient will get notified. When a second group member triggers the condition, a new email will not be sent.

SOIL SCOUT

ADD NEW DEVICE / EDIT DEVICE PROPERTIES

Creating a New Scout or clicking on the pen book ✎ symbol the device list will open a new window with device specific properties.

Give the Scout a friendly and informative name, which also makes sense in the alphabetical Device list.

Scout serial number is the 5-digit ID number on the device, such as "15678".

Select which soil type your sensor will be installed in. The system will suggest a dry bulk density, which is required for the Salinity extrapolation. Feel free to put in a more exact value, in case you have one.

Choose a location from the map. This is essential to both using the Map Page as well as communicating with Soil Scout representatives. If you have recorded in-field coordinates, type them into the *Find box*.

The preferred coordinate format is degree decimals, such as: 61.474344, 21.889887.

If you enter coordinates in some other format (such as 61°28'27.6"N 21°53'23.6"E), make sure that the conversion occurs accurately.

Depth/Height is important for later reference.

You can include the new Scout into groups when creating or edit it later.

On the *Receivers Page* 📶 you can create New Base or Echo in a similar manner. The key difference is, that the Base has a 15-digit IMEI number like "357890123456789", while Echo repeaters have a 5-digit serial number, such as "57890".

⚠ *Whilst coordinates and depth/height are optional fields, we strongly recommend that you measure these as accurately as possible and enter the appropriate information in case need to find the Scouts later. When cm-accuracy satellite equipment is not available, best practice installation of Scouts includes using above ground sight lines and distances to fixed objects to compensate for the fact that typical GPS has a signifigant margin of error.*

MISCELLANEOUS NOTES

Soil moisture is always stated as the volumetric moisture fraction, i.e. a value 25% means that there is 2,5 decilitres (or 250 grams) of water in one litre of wet soil.

Time stamps are presented in the time zone of your browsing device. However, the CSV export uses Greenwich Mean Time (GMT) zone Coordinated Universal Time (UTC) time format, such as "2020-08-03T14:20:22.970198Z"

Salinity is a Hillhorst (2000) equation extrapolation of what the Electrical Conductivity (EC) would be if the soil was saturated wet. When soil is dry, the extrapolation is inaccurate. The accuracy is approximately as follows: Good = moisture > 40 %; Intermediate = moisture 25-40 %; Inaccurate = moisture < 25 %.

Backups of the server and databases are saved periodically, but any changes you make in the online configuration (coordinates, soil types, etc.) will take effect immediately and are irreversible.

Soil type is saved for each measurement data point according to the present Device Properties. If you change soil type later, it will influence future measurements, but will not recalculate old ones.

Read only user level will keep some of the mentioned features hidden for such users.

On mobile devices with narrow screens, Device list and Graphs are not presented simultaneously. Also some comparison features cannot be used due to excessive complexity.

ⓘ *The information in this document has been provided in good faith and is accurate to the best of our knowledge at the time of writing. Any errors or omissions are unintended. New features and aesthetic styling of the service is an ongoing process, and this guide may occasionally be outdated.*

SOIL SCOUT - GAIN A DEEPER VIEW!